Remarks

Claims 1-2 are still at issue, original Claims 3-9 have been canceled by a previous action, and now Claims 10-16 are at issue. Claim 1 still stands rejected based on 35 USC 102(b) as being anticipated by Dougherty et al (US 6,452,361). Claim 2 still stands rejected based on 35 USC 102(b) as being anticipated by Chan et al (US 6,611,166). Claim 10 stands rejected under 35 USC 102(b) as being anticipated by Koga (US 6,268,710). Claims 11 and 12 stand rejected under 35 USC 103(a) as being unpatentable over Koga in view of Grunert et al (US 4,691,180). Claims 13 stands rejected and Claim 14 is objected to based on 35 USC 103(b) as being unpatentable over Koga in view of Chan et al. Claim 15 stands rejected under 35 USC 103(a) as being unpatentable over Koga in view of Haner (US 2,819,410). Claim 16 stands rejected under 35 USC 103(a) as being unpatentable over Koga in view of Munshi (US 6,645,675).

Change of Correspondence Address

Note that Applicant is no longer represented by legal counsel (pro se) and all correspondence is to be sent to Applicant's home of record as listed in the original patent application and in this amendment.

Request for Examiner's Assistance In Drafting Claims

The following remarks are intended to demonstrate reasons why the present invention is patentable and to make the new claims more conforming to the subject matter in the specification. If the examiner agrees the invention is patentable, but does not feel the present claims are technically adequate, Applicant respectfully requests the Examiner to either modify the present claims to make them acceptable in a manner that raises no new issues or else write acceptable claims pursuant to MPEP 707.07(j). Applicant no longer has legal representation available in this case; however, Applicant does understand the normal procedure for making this request usually occurs before a final rejection. Applicant also understands that if the Examiner does draft claims as requested, then it is done as an exceptional favor to the Applicant.

Clarification and Reasons for Drafting New Claims

Claim 10 was rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enabling requirement because the claim, as written, contains subject matter which was not described in the specification. Applicant fully agrees with the Examiner on the point of rejection because Claim 10 was improperly written seemingly to claim subject matter which the Examiner kindly pointed out was not included in the specification. More specifically, the Examiner acknowledged the specification and drawing clearly showed the electrical energy storage device would be placed in parallel with the electrical power source and in parallel with another series circuit formed by the electrical load device and control capacitor if both of the switches were closed simultaneously. The Examiner further pointed out that the Applicant stated clearly in the specification, and showed in the drawing, that if the switches were both closed simultaneously, then a destructive electric current would flow and the circuit would be inoperable. A person skilled in the art would then conclude the normal operation of the circuit would never include closing both switches simultaneously and would probably include closing one switch while the other switch remained opened electrically. Any person skilled in the art would then also obviously conclude that when one of the switches is closed, the electrical energy storage device is placed in series electrically with another series circuit formed by the electrical load device and the control capacitor. And similarly, when the other switch is closed, the electric power source would be placed in series with another series circuit formed by the electrical load device and the control capacitor, thus placing all of the components in a series electrical configuration. Claim 10 was canceled and most elements were incorporated in both new Claim 17 and new Claim 18 to more closely conform to the subject matter as described in the specification, which was correctly pointed out by the Examiner to include placing components into electrical series configurations at the proper times by opening and closing the respective switches, and never placing the components into a parallel electrical configuration by closing both switches simultaneously, since in the

latter case, the circuit would be inoperable. Claim 10 stands rejected as being anticipated by Koga in that, "...a capacitor electrically in parallel with the electrical energy storage device..." and "...and an electrical power source electrically in parallel with the capacitor..." Applicant acknowledges Claim 10 was improperly written and Applicant takes full responsibility for not adequately reviewing the written content of Claim 10 before it was submitted. Claim 17 and Claim 18 are written to conform to the Examiner's observation that proper operation of the circuit must only include placing components into series electrical configurations by closing the appropriate switches. However, Applicant now acknowledges a circuit must first be provided for in the content of both new Claim 17 and new Claim 18 to show the specific components in those specific series electrical configurations before the method of operation begins, and as keenly pointed out by the Examiner would be required to allow the invention to accomplish a new and different task. Applicant submits that Koga did not anticipate a circuit or a method for energizing an electric energy storage device to a very high dc voltage by receiving electric energy from a control capacitor that was energized and de-energized through an electrical load device. Applicant submits that the "load" in the Koga invention is clearly in parallel with other components and never in series with a control capacitor. Thus, Applicant also submits that Koga did not anticipate a circuit or a method for de-energizing an electric energy storage device from a high dc voltage by supplying energy to a control capacitor through an electrical load device and then de-energizing the energized control capacitor through the electrical load device in the reverse direction. Applicant further submits that Claim 17 and Claim 18 should therefore be allowed.

Claim 1 was rejected under 35 U.S.C. 102(b) as being anticipated by Dougherty et al. The Applicant agrees with the Examiner that, "any real inductor has a small voltage drop between neighboring coils, and thus a capacitive effect exists, and therefore it is inherently a capacitive device..." The energized inductor in the Dougherty invention would admittedly supply energy to the starting battery when

current flow through the inductor is interrupted after the transistor becomes non-conductive and acts as an open switch. However, the Applicant wishes to point out that proper operation of the circuit in the present invention involves the control capacitor to not only exhibit a certain amount of capacitance, or capacitive effect, in the circuit, but to also act as an open switch to stop all flow of direct current once the control capacitor is energized to the voltage of the electrical power source. There was a bit of understandable confusion on those grounds because Part (b) of the original Claim 1 was rejected for stating, "...until said capacitor is energized to a voltage equal to the voltage of the electric power source to stop electric current from flowing...". A well-understood and universally-accepted electrical principle is that a real capacitor will act as an open switch to dc current after the real capacitor is energized, but an inductor has minimal resistance to dc current when it is energized. Moreover, use of an inductor in place of a real capacitor in the Dougherty invention would make the present invention novel and unobvious because the present invention can work at extremely high operating voltages when a real capacitor is used as the control capacitor, while the Dougherty invention is limited to much lower working voltages with the use of an inductor in place of a real control capacitor. Claim 1 was re-written as Claim 17 and the new claim seeks to omit the point of misunderstanding. Claim 17 has also been written with the intent of emphasizing that the control capacitor is energized from the electric power source through an electrical load device, and subsequently, the control capacitor is de-energized through the electrical load device to the electric energy storage device. The Examiner has correctly pointed out both the specification and drawing clearly shows the components are intended to be connected in a series electrical configuration, and the Applicant agrees. The Examiner has introduced another good reason for the present invention to be unobvious, novel, and thus, patentable - especially over Dougherty - in that there are probably many combinations and types of electrical components that can exhibit varying degrees of inductance and capacitance in a circuit, but the present invention uses the minimum number of components conceivably possible to accomplish the method

of operation known to be the present invention. Therefore, the present invention is an improvement over any cited prior art, including Dougherty, because it is more efficient, more effective, simpler, and cheaper to build, yet it can still operate at extremely high voltage levels without experiencing component damage as would undoubtedly occur in any of the inventions cited as prior art. More specifically, Dougherty's invention is clearly limited to operating voltages into the tens of volts dc, while a main object of this present invention is to operate with operating voltages possibly into the tens of thousands of volts dc. Thus, Applicant submits that Dougherty did not anticipate a circuit or a method for energizing an electric energy storage device to a very high dc voltage by receiving electric energy from a control capacitor that was energized and de-energized through an electrical load device. Applicant also submits that Dougherty did not anticipate a circuit or a method for de-energizing an electric energy storage device from a high dc voltage by supplying energy to a control capacitor through an electrical load device and then de-energizing the energized control capacitor through the electrical load device in the reverse direction. Applicant further submits that Claim 17 and Claim 18 should therefore be allowed.

Claim 2 was rejected under 35 U.S.C. 102(b) as being anticipated by Chan et al. Chan discloses in the cited reference (column 3, lines 37-43) that, "The charge pump receives a DC supply voltage and generates a DC output voltage of a different magnitude and/or polarity. Conventional charge pump circuits include capacitor arrays that are charged from a supply voltage source (e.g., a battery) using switches operated in a pre-determined sequence..." which describes what is happening in Figure 3, elements 200 and 202, in the associated cited drawing. Admittedly, Chan does anticipate the use of capacitor arrays being charged from a supply voltage source in conventional charge pumps, but there is no clear indication as to how the capacitor arrays are connected to the supply voltage source for receiving electric charge. Therefore, a quick review is warranted of how the task of charging and discharging a capacitor, or a capacitor array, is

done in a conventional charge pump. In charge pump configurations, a capacitor, sometimes known as a "flying capacitor", is charged with energy from an electric power source or supply, and then isolated from the power supply. The stored electric energy in the capacitor is then transferred to an electrical load by proper switching action. It is the variation of the present invention from the normally accepted method of operation of a conventional charge pump that makes the present invention unobvious and novel for the simple reason that the present invention uses a control capacitor, which can be likened to a flying capacitor in a conventional charge pump, connected in series - always in series - with the electrical load device while the capacitor is being energized by a voltage supply source. All known conventional charge pumps include charging the capacitor from the voltage supply source and then subsequently discharging the capacitor through the electrical load device after the proper switching is made. The control capacitor in the present invention, however, is placed in series with the electrical load device and the electric power source for a unique reason: to limit electric current through the switches, and then to eventually stop all dc current from flowing in the circuit while the real switches are being opened or closed. The control capacitor in the present invention must always charge and discharge through the electrical load device regardless of what the electrical load device is comprised of. It is the action and control of the control capacitor, by being placed in series with the electrical load device and electrical energy storage device, which allows the electric energy storage device to be de-energized from extremely high voltages with extremely high power levels. Conventional charge pumps are used at relatively very low voltages and very low power levels. If the present invention is to be compared to a conventional charge pump as disclosed in any prior art, including Chan's invention, then the cited prior art should disclose a charge pump that can de-energize an electrical energy storage device, such as a capacitor, to and from high voltages, respectively, and those operating voltages should be into the tens of thousands of volts dc as is a main object of the present invention; otherwise, the present invention is novel, obvious, and thus patentable over the cited prior art, or any combination thereof.

There simply is no known method to de-energize an electric energy storage device, such as a high-energy capacitor, from extremely high voltages in a safe and efficient manner. Thus, the present invention solves a long-felt, long-existing, but unsolved need which also makes it unobvious, novel, and useful, by charging and discharging a control capacitor - which is always electrically placed in series with an electrical load device – in order for charging and discharging to be done through the electrical load device. It is anticipated this present invention will be marketed soon and will become commercially available to be used in a regenerative braking device in an automobile where a conventional high-voltage, high-energy capacitor is energized very rapidly during braking and then slowly de-energized to supply stored braking-energy to the traction motors during acceleration. Such an application would allow for simple and cheap methods of recovering braking energy, because a conventional capacitor can recover and store energy faster and more efficiently than either electrochemical batteries or ultracapacitors. A shoebox-sized circuit of this design will be used to safely and efficiently energize and de-energize the capacitor to and from extremely high voltages, respectively. There is no circuit available today that is as simple and cheap to build as the circuit known as the present invention which can accomplish the tasks mentioned; otherwise, they would already be commercially available and in use on a grand scale. All of the cited prior art including the inventions of Chan, Dougherty, Munshi, and Koga would be destroyed or would be rendered inoperable by the high voltage and power levels in the proposed regenerative braking scheme as mentioned above, because the electrical load devices in those inventions are improperly placed in the circuitry. Applicant submits that Chan did not anticipate a circuit or a method for energizing an electric energy storage device to a very high dc voltage by receiving electric energy from a control capacitor that was energized and de-energized through an electrical load device. Applicant also submits that Chan did not anticipate a circuit or a method for de-energizing an electric energy storage device from a high dc voltage by supplying energy to a control capacitor through an electrical load device and then de-energizing the energized control capacitor through the

electrical load device in the reverse direction. Applicant further submits that Claim 17 and Claim 18 should therefore be allowed.

Concluding Remarks

The Applicant submits the present invention is patentable because it is novel and unobvious due to the inherent nature of its ability to handle extreme magnitudes of voltage and power. The circuit is simple and can be built cheaply, yet it can accomplish future and present tasks that cannot now be accomplished in a similar manner. High voltage electric energy storage devices can now be constructed and used commercially that exhibit both a high energy-density and a high power-density. Only the present invention would be effective in energizing and de-energizing such new high-voltage storage devices. Furthermore, the characteristic of charging and discharging a control capacitor through a series-connected electrical load device in order to temporarily store energy and then eventually transfer the stored energy to or from an electric energy storage device or electric power source, respectively, is both new and novel.

Prompt reconsideration and allowance are respectfully requested.

Respectfully submitted,

By James S. Hacsi

Applicant

James S. Hacsi
13 Dartmouth Ave.
Pueblo, CO 81005

Certificate of Facsimile Transmission
I certify that on the date below I will fax this communication, and attachments if any, to Group 2838 of the Patent and Trademark Office at the following number: (571) 273-8300
Date: 30 April, 2006
Inventor's Signature James S. Hacsi